In FIG. 1:

1. Nodes 1 & 5 are IS—IS routers.
2. Nodes 2–4 are non-IS—IS routers.
3. MAs are used in nodes 1 & 5, each MA containing the System IDs of nodes 2–4.
4. The link between nodes 2 & 3 is broken.
5. The routeing for nodes 2–4 is via node 1 due to shortest path routeing in the IS—IS Domain.

In the existing situation under ISO 10589, routeing is from node 1 to node 4, node 2 returns the message to node 1, which then sends it back to node 2 due to the MA. The message continues looping between nodes 1 & 2 until its lifetime expires and is deleted.

MA Alternate Routeing provides resilience when MAs are used to route to groups of non-IS—IS NEs, allowing benefit from the use of multiple connections between the IS—IS domain and the group of non-IS—IS NEs. It achieves the resilience by controlling the state of the advertising of the Manual Adjacencies. On detection of the looping of messages due to a link break in the non-IS—IS group, the IDs of the NEs for which messages have been 'looped' are removed from the IS—IS Level-1 advertising process (link state information). This allows the MAs in the alternate interdomain connections to be selected instead.

Manual Adjacencies that point to groups of NEs contain a list of the System IDs (part of the overall NSAP) of the non-IS—IS NEs, the MA also contains the port to be used to reach these NEs. When a break occurs in the non-IS—IS group, a number of NEs may become unreachable and cause messages to be looped.

When a message (NPDU) is received on a port to which it will become routed (according to the MA), the System ID of the Destination NSAP of the NPDU is removed from the SID list of the MA. To do this, the MA will first be taken 'down' it will be taken back 'up' when the SID has been removed.

To avoid the MA "flapping up and down" as the unreachability is detected for each SID in the MA, a Hold-Off timer (16-32s) is used. This allows the collection of all SIDs associated with the break, before the MA is taken down for the removal of the SIDs.

To allow the SID to be reinstated, automatically, after the recovery of the failure, the SID is reinstated on the expiry of a single, jittered, Recovery Timer (approx. 5 mins). This is only done, however, if no other route exists for the destination node, in the IS—IS domain.

The present invention is also applicable to other Link-State dynamic routeing protocols, that use static routes to interwork with dissimilar routeing protocols.

Referring again to FIG. 1, with the present invention routeing is from node 1 to node 4, the first time a message is sent back from node 2 to node 1 (due to the break), the loop is detected and the System ID of node 4 is removed from the MA in node 1. The change in the MA in node 1 will then be propagated to the IS—IS Level-1 subdomain. All the Level-1 routers in this AREA will then recalculate their routes. There will now be a route to node 4 via node 5. Messages sent to node 4 before the recalculation has taken

place will probably be lost in the network. This is covered by the recovery mechanisms in upper layer protocols (layer-4 say).

What I claim is:

1. A synchronous digital hierarchy (SDH) based communications network, comprising:

a) a plurality of data communications channels embedded within the network;

b) a plurality of intermediate systems (IS) divided between at least one non-IS—IS area and at least one IS—IS area within which a routing protocol forming part of a network layer of an open systems interconnection (OSI) is provided for routing a message from said at least one IS—IS area to a destination IS within said at least one non-IS—IS area, there being a plurality of connections between said at least one IS—IS area and said at least one non-IS—IS area;

c) a plurality of manual adjacencies (MAs) constituting static routes at one of the IS within said at least one IS—IS area, for identifying routes to at least one network equipment (NE) within said at least one non-IS—IS area; and

d) means for removing from the MAs an identification of said at least one NE from which the message has been returned [from the MAs] after at least one of the connections to the destination IS within said at least one non-IS—IS area was broken, and for allowing routing of the message via alternative MAs.

2. In a synchronous digital hierarchy (SDH) based communications network including:

A) a plurality of data communications channels embedded within the network, and

B) a plurality of intermediate systems (IS) divided between at least one non-IS—IS area and at least one IS—IS area within which a routing protocol forming part of a network layer of an open systems interconnection (OSI) is provided for routing a message from said at least one IS—IS area to a destination IS within said at least one non-IS—IS area, there being a plurality of connections between said at least one IS—IS area and said at least one non-IS—IS area,

a method of routing the message, comprising the steps of:

a) creating a plurality of manual adjacencies (MAs) constituting static routes at one of the IS within said at least one IS—IS area to allow routing to at least one network equipment (NE) within said at least one non-IS—IS area;

b) returning the message from [the MAs] said at least one NE to said at least one IS—IS area after at least one of the connections to the destination IS within said at least one non-IS—IS area was broken; and

c) removing an identification of said at least one NE from which the message has been returned from the MAs, and allowing routing of the message via alternative MAs.